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ABSTRACT

A discussion of functional language proficiency considers several widely-accepted theories of cognition, draws parallels between specific stages of intellectual maturity and development of second language proficiency, and suggests ways in which teachers may be able to help students progress from one stage to another within the context of foreign language instruction. The work of Lev Vygotsky linking linguistic and cognitive development is first outlined, and William G. Perry, Jr.'s study of adolescent and young adult development is examined. Piagetian theory concerning child and adolescent development in the context of education is also summarized, with descriptions of the four broad periods of intellectual development. Subsequent work by Bruner and others on the development of language together with cognition is reviewed. Suggestions for classroom application of these concepts focus on provision of a second language learning context as similar as possible to that of native language learning, with maximum exposure without immediate demands for production. The teacher should act as an interested and sympathetic interlocutor, not placing too many demands on the student. Emphasis on message and form must be balanced. A 17-item bibliography is included. (MSE)

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Developmental Stages in Functional Language Proficiency

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Introduction

If one were to investigate the history of foreign language instruction in the United States from the turn of the century to the mid-eighties, a subtle but interesting pattern would begin to emerge. Grammar translation, cognitive code learning, audiolingualism, the Silent Way, Counseling Learning/Community Language Learning, the Dartmouth method, suggestopedia, communicative competence—each has brought its ritual and litany to the classroom. Yet each has invariably left both student and teacher with a disquieting premonition that somehow, for some reason, all is not quite right. Conscientious effort in the classroom does not seem to be rewarded by the ability to use language spontaneously outside the classroom. In some instances we defend the product of our efforts as teachers by insisting that for "real mastery" to develop, a stint in a country where the language is spoken natively must also be a part of the learner's experience. On other occasions we flail ourselves with talk of our own inadequacies in the classroom, or the lack of funds to support the educational enterprise, or the regrettable lack of intellectual ability our students have brought to the classroom. And through it all we tend to remain blissfully unaware of one source of information that might help us understand more completely why our students perform as they do, and that might argue strongly for substantive changes in our perceptions of the process of language learning. That source is the body of research in cognitive psychology.

Recently, the attention of the foreign language teaching profession has turned to an approach used by several governmental agencies to determine

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the skill with which an individual can perform orally in a second language. The assessment strategy, known as the oral proficiency interview (OPI), suggests that one cannot adequately measure foreign language competence by testing discrete skills alone: a more global, or integrative approach is necessary. Furthermore, for the measure to be thorough, it should check to see 1) *what* functions the individual can carry out (in other words, what can the speaker do with the language), 2) the contexts within which these things can be done, and 3) the accuracy with which the tasks are performed. The OPI strives to satisfy these criteria, describing performance in terms of ranges from "no functional ability" to "ability equivalent to that of an educated native speaker." (ACTFL, 1985) Although individual characteristics differ, certain features are shared by all of the speakers within any given range, just as are specific limitations. For example, language users who are rated as Intermediate (be they Low, Mid or High) *will be able to* create original meaningful utterances in the language, ask and answer questions, and use the second language to get into, through and out of a simple situation such as arranging an appointment. Similarly, Intermediate speakers *will be unable to* consistently narrate events and describe settings in past time with any degree of accuracy. At the Advanced level, speakers are expected to demonstrate that they can get into, through, and out of situations with a complication, as well as narrate and describe in past and future time. However, the Advanced speaker *cannot* hypothesize or support opinion adequately. Thus each range has its own descriptors in terms of function, context, and accuracy, and on the basis of the OPI, a candidate can be rated quite reliably by trained interviewers.

As we begin to look objectively at the many factors that help us determine how to express ourselves at any given moment, or that enable us to process and understand language generated by another person, either orally or in writing, we become increasingly aware that at some point "knowledge," or cognitive ability becomes a key factor in an individual's performance. But how does one draw distinction between ability in language use and cognitive ability? Is it possible that one subsumes the other? If a student fails to hypothesize, for example, can one be certain that the problem is linguistic rather than cognitive? Much has been written about stages of intellectual development, yet few efforts have been made to investigate the relationship between second language acquisition and cognitive ability. Furthermore, the research that has been conducted is weak with respect to research design and control of variables, since it is for the most part descriptive and subjective in nature—hardly strong bases for supporting or rejecting hypotheses. It is significant, therefore, that the profession is beginning to talk about the commonalities of the two, because out of these informal discussions and presentations will eventually emerge a

body of hard data research that will contribute much to our understanding and appreciation of the phenomenon of language acquisition.

This paper will consider several widely accepted theories of cognition, draw parallels between specific stages of intellectual maturity and development of proficiency in a second language, and suggest ways in which teachers may be able to help students progress from one stage to another within the context of foreign language instruction.

Of Thought and Language

At its most basic level, thought might be defined as mental activity that is one step beyond a stimulus/response reaction. More complex thought is generally associated with or described as the generation of an idea, or perhaps even as a more sophisticated process that involves the formation of concepts. As language teachers, it is this notion of thought as process and concept formation that is of most interest, since our task is to help students learn to express themselves and communicate their ideas effectively and efficiently in a second language. The ability to understand (or at least identify) the processes the language learner follows in assigning meaning to a particular word, in assigning a word to a category of meanings, and in forming concepts may provide valuable insights that have strong implications for curriculum design, instructional strategies, and materials development.

In 1934, the results of a series of investigations in developmental psychology, education, and psychopathology that had been conducted by Lev Semenovich Vygotsky were published. Appearing only a few months after the author's death, the essays were almost immediately suppressed by the Russian government and did not surface again until 1956, when they were included in a volume of the author's selected works. But it was not until 1962 that the English translation entitled *Thought and Language* was published, and Vygotsky's conception of linguistic and cognitive development became known outside his own country. (Vygotsky, 1962)

The young Russian based his theoretical and critical discussions on the premise that thought and speech have two different genetic roots and that the two functions develop along different lines that are independent of each other. According to Vygotsky, if one plots the developmental curves of thought and speech, a prelinguistic (or "non-speaking") phase can be identified in the development of thought, just as a preintellectual (or "non-thinking") phase can be discerned in the development of speech. In other words, through observation one can recognize instances in which young children demonstrate that they understand what is said by reacting to language used in their presence, but they, themselves, still cannot produce meaningful speech. Similarly, much of the very early babbling and verbalization emanating from babies contributes to the subsequent ability

to form the necessary sounds, words, and phrases associated with intelligible speech, but does not seem to be based upon an intellectual decision-making model of speech production. By about the age of twenty-four months, the two curves join and the child becomes able to communicate. From that point on, Vygotsky theorizes that an ongoing and increasingly complex mental process ensues that results in the development of the child's native language ability.

During this very early period the learner progresses through four stages in terms of cognitive activity. First, the child acquires a dim realization of the purpose of speech and begins to ask for things with words instead of with simple cries (in English, for example, the words might be mama, wawa, go, etc.). Second, a will to conquer the language seems to develop to address the child's need and desire to communicate. Third, the young learner passes into a stage where the discovery is made that "everything has a name," and a more extensive lexicon begins to develop quite rapidly, which enables further self-expression with a more complex syntax. Finally, the child enters the stage in which thoughts can be verbalized and speech becomes quite rational. (Vygotsky, 1962)

Simultaneous with the evolution of cognition, the child passes through four stages of speech development. To begin with, the infant is born into the primitive or natural stage, where all sounds begin as no more than pre-intellectual babbling. The second stage is characterized by "play" with the language, considerable unintentional misuse of lexicon, gross overgeneralization of meaning (i.e., all four-legged animals are "doggies"), and correct use of many grammatical forms without an awareness of or attention to the logical operations necessary to generate those forms. During this stage, the child is "immersed" in an environment where the language is being used and is improving his or her performance based on that experience. (It is interesting to note that this view would support the long-held attitude of many educators that the linguistic and intellectual richness or deprivation of the home environment is a critical factor in determining whether or not the child will be able to function effectively once the period of formal schooling begins.) In the third stage, the child begins to demonstrate an awareness of external signs and operations, using the fingers to count on, reciting lists such as days of the week, employing mnemonic devices, and otherwise indicating a preliminary awareness and sensitivity to the organizing principles of the language. The fourth stage, which might be thought of as the "logical memory" stage, is characterized by generally well-patterned use of the language, although there may still be some systematic errors occurring, particularly among less frequently used structures or more infrequent lexical categories.

But the developmental process leading to speech production that Vygotsky hypothesized did not explain adequately the "thinking" process. So, in an effort to investigate concept formation, Vygotsky and his associates conducted a series of experiments with some three hundred people—children, adolescents, and adults—and identified three basic phases in the "ascent" to concept formation: 1) unorganized congeries, 2) thinking in complexes, and 3) thinking in concepts. Summarizing his findings, Vygotsky reported:

> The development of the processes which eventually result in concept formation begins in earliest childhood, but the intellectual functions that in a specific combination form the psychological basis of the process of concept formation ripen, take shape, and develop only at puberty. . . . Concept formation is the result of a complex activity in which all the basic intellectual functions take place. The process cannot, however, be reduced to association, attention, imagery, inference, or determining tendencies. They are all indispensable, but they are insufficient without the use of the sign, or word, as the means by which we direct our mental operations, control their course, and channel them toward the solution of the problem confronting us. (Vygotsky, 1962, p. 58)

The researchers do not describe in detail the concept formation tests, although it is known that wooden blocks of different sizes, shapes, and colors were used. On the bottom of each block was written one of four nonsense words in Russian (lag, bik, mur, cev), and all the blocks were combined into one large group. The investigator would show the subjects a word on the bottom of one of the blocks and then ask them to pick out other blocks they think might belong to the same group. As the blocks were selected, the investigator revealed the word on the bottom, thus confirming or rejecting the conceptual framework (i.e., the criteria or reasoning processes) the subjects were using to govern their selections. The investigators maintained that the characteristics of the blocks selected by the subjects and modifications made in the selection process as the experiment progressed revealed the steps in the reasoning of the subjects. Based upon these experiments, then, Vygotsky and his associates classified the three basic phases mentioned above.

In the first major phase identified by the researchers—unorganized congeries—the child seems to link words and objects by chance or completely at random. This would correspond to that stage in a child's language development when a single word may be used to convey a variety

of meanings. "Wawa" may be used as the word for "rain" or may be used to represent "a glass of water" or "I want a drink of water" or "I spilled the water on the floor" or "Pour the water here" or "This is where water comes from" (pointing to a faucet, for example). These syncretic relationships result in objects and ideas being "heaped together" so that all are represented by the same word or group of words. Verbs may be nominalized (e.g., "kitchen" used to designate the verb "cook"), nouns misused ("car" for "mailbox"), expressions unrelated to situations ("bye-bye" in the middle of a visit), and so on. Lexicon becomes grouped through trial and error, with the child retaining those words that seem to produce meaning to the adult with whom the child is communicating. At this point, however, there would appear to be no process of systematization or lexical analysis that the child uses to determine the grouping of new vocabulary items.

As the child's vocabulary grows through this trial-and-error process, a systematic grouping strategy does develop, with contiguity in time and space or some other visually and immediately perceived characteristic apparently dictating the organization of the groupings. Soon after, the child begins to transfer words between the various "heaps" that have been established, looking for more order among groups. Groups of four-legged animals with tails standing together are all "cows" to the young learner, until a more specific schema is developed for "four-legged things with tails" that enables the child to distinguish between dog, cow, horse, deer, and so on.

The second major phase in concept development—thinking in complexes—is characterized by the fact that bonds between groups of words do exist, and are much more sophisticated. To use the earlier illustration, a child in this stage can distinguish cows from other animals, but would have difficulty drawing distinctions among bovines (i.e., cow/bull, calf/yearling, bull/steer, Guernsey/Holstein, and so on). Bonds seem to rest on associative characteristics (size, shape, color), same/different traits (green/not green), groups of features (either red or green, round or square), which at times may be concrete and at other times be vague and diffused, or pseudo-concepts—generalizations formed in the child's mind that are based on perceived attributes rather than on the nature of the object. This second major phase would correspond most likely to that child language period when the preschooler is often uttering "cute" statements reflecting what adults perceive as "naïve" or "innocent" explanations of situations or phenomena. Children create "definitions" for unknown words, or weave "fairy tales" or fantasies to explain events that are new to them. In effect, the youngster is attempting to use a limited "known" (the language the child possesses) to interpret a limitless unknown (the myriad world of adult language use in which the child is immersed).

As the child matures, new meanings and generalizations evolve, and the third phase of concept formation is realized. The environment within which the child exists offers stability and permanence to the meaningfulness of language. As more and more life experience is accumulated, the child begins to make decisions and draw conclusions based upon more complex criteria. Comparisons and contrasts are made, inferences are drawn, hypotheses are developed, positions are stated and defended, and the learner enters the sphere of adult language use. Intellectual tasks that were earlier too complex for the child are now possible, and the person can express effectively the results of those tasks. The individual can abstract and single out elements of an experience, view those elements apart from the experience as a whole, draw conclusions, synthesize and analyze, all based upon a process of reasoning. The relationship described by Vygotsky has been attained. "The relation of thought to word is not a thing but a process, a continual movement back and forth from thought to word and from word to thought." (Vygotsky, 1962, p. 125)

Intellectual Development in the Young Adult

In the early 1950s, a major study was launched at Harvard and Radcliffe by a group of university psychologists in an effort to document the experience of undergraduate students during their four years of college. The results of that study were subsequently published in 1968 and offer considerable insight not so much into what a person "knows" as into the sequence of intellectual development that accompanies the journey from adolescence to adulthood. (Perry, 1968) Since most second-language instruction is directed toward the adolescent or adult learner, the results of Perry's work may be of value in helping distinguish between linguistic performance and cognitive performance.

Instead of relying upon intelligence tests or psychological questionnaires, Perry and his associates conducted a series of taped conversations with students in which the participants were invited to "think, taking their own time, doing it in their own way, choosing their own topics." (Perry, 1968, p. vi) Once the material was collected, it was analyzed by independent researchers to avoid investigator bias. As a result of the success the researchers had in conveying a feeling of genuine interest in the conversations, the students responded with sincerity and made a concerted effort to formulate and express their personal feelings and reflections on the topics considered.

The pattern of intellectual development that evolved from the studies at the two institutions was characterized as a three-part process—Duality, Multiplicity, Relativism—with each of these parts further divided into three

positions. Viewed broadly, the adolescent begins with an attitude of Duality, in which all things are viewed as part of a dichotomy: We/They, right/wrong, good/bad, yes/no, can/cannot, and so on. Absolute knowledge is attainable, and Authority has the answers. The purpose of the education process is to learn to identify the correct answers, procedures, responses, as determined by Authority. The goal to be attained is to satisfy Authority and become one of Us as opposed to one of Them.

As an awareness of the legitimacy of diversity of opinion develops in the adolescent, so the second part of the scheme—Multiplicity—emerges. Here, the individual acknowledges the existence of uncertainty and ambiguity. Multiple opinions are possible and legitimate, but only temporarily, because they occur only in those areas in which Authority has not yet found the Truth. In the later positions of Multiplicity, the person begins to accept the idea that "everyone has a right to his/her own opinion." Comparisons and contrasts are possible, hypotheses generated by and original to the individual are tolerated, although logical reasoning may not be sufficient basis for reaching a conclusion, since more that one equally "logical" alternative may be offered.

As the individual begins to realize that all knowledge and values (including Authority's) are both contextual and relativistic, a new part of the scheme—Relativism—develops. Different perspectives on an issue may result in different answers or positions. The person is now able to see various sides of an issue, perhaps even argue both sides intellectually. Knowledge, meaning, values, all begin to be considered in terms of their relationship to the student's own life. "I am the Master of my Fate, I am the Captain of my Soul" might be the rallying cry as one moves into Relativism. Words like "commitment" and "responsibility" become critically important to the decision-making process. As Perry (1968) explains it,

> The drama of development now centers on this theme of responsibility. The hero makes some first definition of himself by some engagement undertaken at his own risk. Next he realizes in actual experience the implications of his initial Commitments. Then, as he expands the arc of his engagements and pushes forward in the impingements and unfoldings of experience, he discovers that he has undertaken not a finite set of decisions but a way of life. (Perry, p. 153)

Jacobus (1985) attributes a fourth heading of Dialectic to the Perry scheme, wherein the learner is able to consider, evaluate and reformulate hypotheses and conclusions and, in a sense, "construct knowledge." (Jacobus, p. 7) However, the present authors have been unable to

substantiate the additional heading based upon the report of the Perry group.

Piaget Revisited

Perhaps no other psychologist in this century has had the profound effect on current educational thought than has Jean Piaget. Born in 1896 in Switzerland and educated as a natural scientist, by the middle of the twentieth century he had become the most frequently cited author in professional journals and textbooks on child development. Piaget's primary interest lay in observing and documenting those developmental changes that occur in individuals between birth and adolescence. Like Vygotsky and Perry, Piaget's approach has been "one of systematic observation, description, and analysis." (Wadsworth, 1979, p. 8)

In formulating his theory of intellectual development, Piaget observed that biological acts are acts of adaptation to and organization of the physical environment. (Wadsworth, 1979) This awareness led him to conceptualize cognitive development in much the same way, stating that cognitive acts are acts of organization of and adaptation to the perceived environment—the basic principles of cognitive development being the same as those of biological development.

In order to understand the processes of intellectual organization and adaptation as viewed by Piaget and to define the link between second language learning and cognitive development, one must address four basic concepts—schema, assimilation, accommodation, and equilibrium—used by Piaget to explain the process of mental development.

Piaget believed that the mind had to have structures in much the same way the body does. We have a stomach—a structure that allows us to eat and digest. To help explain why people make rather stable responses to stimuli, and to account for many of the phenomena associated with memory, Piaget used the word *schema*. Schemata are the cognitive or mental structures by which individuals intellectually adapt to and organize the environment in a variety of ways. These structures are the mental counterparts of biological means of adapting. Thus, just as the stomach is the biological structure used to adapt to the environment, so schemata are equivalent intellectual (or cognitive) structures that adapt and change as the child develops.

To better grasp this notion, it is helpful to think of schemata as concepts or categories. Wadsworth (1979) uses the analogy of an index file, each index card representing a schema. When a child is born, he has few schemata (cards on file), but as he grows and develops, his schemata

gradually broaden (become more generalized), become more differentiated and progressively more "adult." Schemata never stop changing or becoming more refined. As an example, Wadsworth describes a child walking down a country road with his parents. He looks into the field and sees a four-legged animal that he has not seen before. The child says, "Look at the big dog!" In terms of intellectual functioning, the child's response could imply that, when confronted with a new stimulus—in this case the cow—the child tries to "fit" it into an available schema (card file). Since the cow closely approximated a dog, (four legs, tail, ears, covered with hair, etc.), he called the cow a dog. He was not able to perceive the differences between a cow and a dog, but he was able to see the similarities.

It is the existence of these schemata, or intellectual structures, that enables us to organize events as they are perceived by separating them into groups according to common characteristics. As children become more proficient at differentiating between stimuli, schemata become more numerous, and as the young learners begin to generalize across stimuli, schemata become more refined.

In order for schemata to change, allowances must be made for the growth and development of the "card file." Adults have different concepts from children, yet their cognitive schemata have their origins in the same sensori-motor schema that the child possesses. One of the processes responsible for this intellectual growth is *assimilation*.

Assimilation is the cognitive process by which the person integrates new perceptual data or stimulus events into existing schemata or patterns of behavior. Piaget borrowed the term from biology, since he perceived this activity to be the intellectual counterpart of eating, where material (food) is ingested, digested and assimilated or changed into a usable form. Assimilation goes on all the time, with the human being continually processing an increasing number of stimuli.

Theoretically, assimilation does not result in the development (change) of schemata, but it does affect their parameters. One might compare a schema to a balloon, and assimilation to putting more air in the balloon. The balloon gets larger (assimilation growth) but does not change its shape (development). However, if assimilation does not produce change, and since we know schenata do change (adult schemata are different from children's), then there must be some aspect of the cognitive process functioning in conjunction with assimilation. Piaget names this concept *accommodation*.

Upon being confronted with a new stimulus, the child tries to assimilate it into existing schemata. Sometimes this is not possible, because the child has no schemata into which the new stimulus can be placed. The characteristics of the stimulus do not approximate those required in any of

the child's available "files." At this point, the child can do one of two things: he can create a new schema into which he can place the stimulus, or he can modify an existing schema so that the stimulus will fit into it—both are forms of accommodation. Thus accommodation can be defined as the creation of new schemata or the modification of old schemata, both of which result in a change in or development of cognitive structures (schemata). Once accommodation has taken place, the child can try again to assimilate the stimulus. Since the structure has changed, the stimulus is readily assimilated. Assimilation is always the end product that the child actively seeks.

Summarizing, then, in assimilation the person imposes his available structures on the stimuli being processed. That is, the stimuli are "forced" to fit the person's existing structures. In accommodation the reverse is true—the person is "forced" to change his schemata to fit the new stimuli. Accommodation accounts for development (qualitative change), and assimilation accounts for growth (quantitative change); together they account for intellectual adaptation and the development of structures that are associated with cognitive maturation.

Just as the processes of assimilation and accommodation are necessary for cognitive growth and development, so, too, are the relative amounts of each that take place. For example, imagine the logical outcome in terms of mental development if a person always assimilated stimuli and never accommodated. The individual would end up with a very few large schemata and would be unable to detect differences in things, thus most things would be perceived as similar. On the other hand, if a person always accommodated and never assimilated, the result would be the presence of a great number of very small schemata that would have very little generality, and the learner would be unable to detect similarities. Either extreme can be disastrous; thus a balance between assimilation and accommodation is as necessary as the processes themselves. This balance is referred to by Piaget as *equilibrium*, with disequilibrium being the imbalance between the two. When cognitive disequilibrium occurs, it provides motivation to seek equilibrium. Thus equilibrium is seen as the necessary condition towards which the organism constantly strives. By extension, then, the process of cognitive development is one in which the learner experiences a state of disequilibrium as a result of being presented with a new stimulus and modifies his intellectual structures in order to attain a state of equilibrium.

Piaget's Periods of Development

For purposes of conceptualizing cognitive growth, Piaget divided intellectual development into four broad periods (these are not discrete stages or steps, but periods of development):

1. The period of sensori-motor intelligence (0-2 years). During this period behavior is primarily motor. The child does not yet "think" conceptually, though some cognitive development is seen.

2. Period of pre-operational thought (2-7 years). This period is characterized by the development of language and rapid conceptual development.

3. The period of concrete operations (7-11 years). During these years the child develops the ability to apply logical thought to concrete problems.

4. The period of formal operations (11-15 years or older). Cognitive structures reach their greatest level of development, and the child becomes able to apply logic to all kinds of problems.

Development is thought to flow along in a cumulative manner, each new step in development becoming integrated with previous steps. As Piaget writes, "the fact should be emphasized that the behavior patterns characteristic of the stages do not succeed each other in a linear way (those of a given stage disappearing at the time when those of the following one take form) but in the same manner of the layers of a pyramid. . .the new behavior patterns simply being added to the old ones to complete, correct or combine with them." (Piaget, 1952, p. 329)

Sensori-motor. The child at age two is cognitively different from the infant at birth, since the newborn performs only reflex activity. Early in the second year, true intelligent behavior typically occurs; the child evolves "new" means to solving problems through "experimentation." Also, the child begins to perceive himself as an object among objects. Toward the end of the second year, the child becomes able to internally represent objects. This ability liberates him from sensori-motor intelligence, permitting the invention of new approaches to solving problems through mental activity. The cognitive development of the sensori-motor period evolves as the child acts on the environment. The child's actions are spontaneous, the motivation for a particular action is internal.

Upon completing the development of the sensori-motor period (before or after age two), the child has reached a point of conceptual development necessary for the development of spoken language and other cognitive skills that will come during the next period of cognitive development, the pre-operational period. From this point on, the child's intellectual development will take place increasingly in the conceptual-symbolic area

rather than exclusively in the sensori-motor area. This does not imply that sensori-motor development ends, only that "intellectual" development is to be affected by representational and symbolic activity rather than by motor activity alone.

Pre-operational period. Qualitatively the thought of the pre-operational child is an advance over the thought of the sensori-motor child. The young learner is no longer restricted primarily to immediate perceptual and motor events, though perception still dominates reasoning. When conflicts arise between perception and thought, as in conservation problems, for example, children using pre-operational reasoning make judgements based on perceptions.

The pre-operational period is marked by some dramatic attainments: language is acquired very rapidly between the ages of two and four; behavior in the early part of the period is largely egocentric and non-social. These characteristics become less dominant as the period proceeds, and by age six or seven children's conversations become largely communicative and social.

While pre-operational thought is an advance over sensori-motor reaction, it is restricted in many respects. The child is unable to reverse operations and cannot follow transformations. Perceptions tend to reflect the egocentric nature of the child. These characteristics make for slow, concrete, and restricted thought.

Concrete operations. The period of concrete operations can be viewed as a transition period during which the child attains the use of logical operations for the first time. Thought is no longer dominated by perceptions, the child being able to solve concrete problems logically. The concrete operational child is not egocentric in his thought. He can assume the viewpoints of others and his language is social and communicative.

While concrete thought is clearly superior to pre-operational thought, it is still inferior to the thought of the older child. Although the youngster in this third stage of development can use logical operations to solve problems involving "concrete" objects and events, he cannot solve hypothetical problems, problems that are entirely verbal, or problems that require more complex or abstract operations.

Formal Operations. In terms of functional ability, both the concrete operational and the formal operational stages are the same, in that the child can employ logical operations to solve problems. The principal difference between the two stages is the wider range of operations that the child can perform with formal thought. While the child in the earlier stage is limited to the solution of problems involving tangible, concrete operations, the realm of the hypothetical is not one that can be dealt with effectively. Similarly, the concrete operational stage is limited to problems of the present, as

opposed to conjectural situations that might be encountered in the future. Formal operations enable the learner to employ theories, use scientific reasoning, understand cause/effect relationships, and follow the line of reasoning underlying an argument.

Beyond Piaget: A fifth stage? In 1973, Riegel suggested that the four stages identified by Piaget failed to represent adequately the great variety of thought processes carried on by the adult, and hypothesized the presence of a fifth stage, which he called the period of dialectic operations. Two years later, Arlin (1975) posited a stage beyond formal operations, and offered empirical evidence to support the existence of that stage. She chose to refer to this new stage as problem-finding (thus going beyond the stage of formal operations, or problem-solving), and maintained that this advanced stage would explain the consistent, progressive changes in thought structures that we often associate with creativity, and which cannot be adequately accounted for by the original categories described by Piaget.

Thus the work of Riegel and Arlin would seem to confirm empirically that differences do exist between the cognitive processing strategies and capabilities of children and adults. As a result, when comparisons are made between native- and second-language acquisition, the age factor must be considered. If, as Vygotsky (1962) says, "the relation of thought to word is not a thing but a process, a continual movement back and forth from thought to word and from word to thought," (p. 215) then most certainly the experiential framework within which the process occurs is a critical determinant of the product. As Higgs (1979) observes, "while methodological factors are doubtless an important part of the total pedagogical picture, other factors also enter in, and some of these may be necessarily antecedent to the methodology or materials." (p. 336) He continues by noting that "there are certain essential things that students have to know before they can speak and understand a foreign language. It is possible that successful foreign-language teachers are successful because something in their approach gets these essentials across in such a form that their students can actually learn them." (Higgs, 1979, p. 336) It is also quite likely that the degree of "fit" between the instructional strategies employed by the teacher and the stage of cognitive development of the learner is one of the major determinants of whether or not a student develops functional proficiency as a result of the classroom experience. The FLES programs of the 1960s provide convincing support to the argument that strategies that work for adolescent and adult learners are not appropriate for the preadolescent.

In summary, then, there would appear to be shared characteristics among a number of theories of cognitive development. First, development of intellectual ability seems to come about in generally sequential stages,

with each stage subsuming the preceding one. Second, there is a progression from concreteness to abstractness in terms of what the learner is able to comprehend and manipulate intellectually. Third, the development of cognitive ability is an active process that is refined through experience. It is the internal processing of external stimuli. And, fourth, the learner's use of language provides one of the primary insights into the level of cognition at which the individual is functioning.

Language As Sign and Symbol

In 1960 a group of researchers at the newly established Center for Cognitive Studies began an intensive investigation into the development of cognition in school-aged children. A number of issues were highlighted as a result of this work and became topics for subsequent research. One observation reported was that in the Western child (as opposed to the Oriental or Asiatic child), once certain processing skills begin to develop (somewhere between the ages of five and seven), the child moves very rapidly "from a technique of dealing with things one aspect at a time in terms of their perceptual appearance to dealing with sets of invariant features several at a time and in some structured relationship." (Bruner, 1966, p. xi) As Bruner describes this quantum leap,

> One sees, for example, that a particular child at a particular age cannot use indirect questions in the game of 'Twenty Questions.' He interprets questions as direct probes for the answer. Some weeks later, the notion of organizing information hierarchically and of using bracketing questions appear with all the abruptness of a rash. The child is suddenly asking indirect, information-seeking questions rather than guessing the answer. (Bruner, p. 5)

Gradually, the child learns to think of the world in which he functions in three ways: 1) the actions he uses in coping with it; 2) the objects upon which he acts, but which are independent of the actions taken toward them; and 3) the language used to express symbolically the interrelationship of object and action. In support of this system of classification that identifies three representations—enactive, ikonic, and symbolic—Bruner makes the following observations:

1. Toward the closing months of the first year of life. . .the identification of objects seems to depend not so much on the nature of objects encountered as on the actions evoked by them. (p. 12)

2. A second stage in representation emerges when a child is finally able to represent the world to himself by an image or spatial schema that is relatively independent of action. (p. 21)
3. The idea that there is a name that goes with things and that the name is arbitrary is generally taken as the essence of symbolism. . .. It is apparent that a fully developed use of symbolic reference in this sense is not immediately available to the child who begins to talk. For one thing, the child first learns words as signs rather than as symbols, standing for a thing present before him and conceives of the word rather as an aspect of the thing. (p. 31)

Based on these views, Bruner suggests that this learning of the "semantic function" of language is a slow process because it is essentially cumulative. In his words, "In learning how to speak or to recognize whether what he hears is semantically sensible or anomalous, the child is learning to match the semantic markers of some words he has learned to the selection requirements of others that he is using in a sentence." (Bruner, 1966, p. 32) This position is supported by the work of Kuhlman (1960), who found that learning semantic markers of words is an intellectual task rather than a perceptual one. As the child develops the ability to use the language, a functional "grammar" guides the process. Although the young learner is unaware of the formalized "rules," they are nonetheless present in varying stages of development. Brown and Fraser (1964) hypothesize that "child speech is a systematic reduction of adult speech largely accomplished by omitting function words that carry little information." (p. 79) They continue by suggesting that:

> As a child becomes capable (through maturation and the learning of frequent sequences) of mastering more and more of the detail of adult speech, his original rules will have to be revised and supplemented. As the generative grammar grows more complicated and more like the adult grammar, the child's speech will become capable of expressing a greater variety of meaning. (Brown and Fraser, p. 79)

In summary, then, the development of language is viewed as moving from concrete (sign) to abstract (symbol), both in terms of the ability to generate meaning (i.e., from language heard and/or writing) and to generate language (i.e., speak and write). Although cognitive processing may occur without manifestation in oral language (as when a hearing- and speech-impaired person communicates), the converse is not true. Human production of language must either be preceded or accompanied by the development of the intellectual ability necessary to form and use the language.

The Foreign Language Learner

Most students in the United States begin the study of a foreign language at a time following the onset of the concrete operational stage as described by Piaget (1952). Children have developed the ability to sequence thoughts into logical reasoning processes and to make decisions based upon the factual information they possess. The child is becoming decreasingly egocentric and is developing greater interest in the use of language for social interaction. Because of the learner's ability to perceive the salient features of objects, to coordinate successive steps in solving problems, to reverse the order of operational procedures and to arrive at conclusions, the learners are said to be more analytical in their performances.

This analytical bent, in turn, has considerable significance to the study of a second language. To begin with, the learner already has many cognitive schemata and is experienced at performing numerous functions. The concept of words, letters, sounds and symbols already is part of the learner's experience. In other words, the student's processing strategies already exist in varying degrees, although the ability to encode and decode meaning in the second language is not present. The second language skill simply is not developed to the point that it can become the medium through which information is received and processed.

One of the major contributions that has been made to the profession by the recent focus on functional proficiency is the improved understanding we now have of the stages through which second language learners progress. The novice learner communicates largely with memorized phrases, one-word utterances, and non-verbal strategies. The intermediate learner functions with sentence-level language, communicating for the most part about concrete things and with little ability to refer to times other than the present. The advanced learner begins to string together language into paragraph-length narrative and description and becomes increasingly capable of communicating about things removed both temporally and spatially from the instance. And the superior learner virtually has complete control of the form of the language, possesses both concrete and abstract reasoning ability, and can talk about things removed and unfamiliar.

Certainly, then, the stages in second-language development reflect increasingly complex cognitive skills. However, it is not these skills themselves that have been developed in the classroom—it is the ability to stimulate these processes in the second language that has been accomplished. Another way of describing the phenomenon would be to say that the learner has experienced a replication of the sequence of cognitive development, but in a high-speed mode, and in a second language. In the foreign language classroom, the individual has passed through the sensori-motor stage of

hearing and reproducing sounds that were largely meaningless, into the pre-operational period, where word- and sentence-length language is used, topics of discussion are most likely egocentric, and so on. The learner then progresses into the period of concrete operations, where logical reasoning and social use of language become quite well developed. And finally, for those who continue to use the second language for communicative purposes, the stage of formal operations can be attained. The user is able to theorize, hypothesize, understand and express cause and effect relationships and function both formally and informally in the language. Essentially, the process has paralleled the development of the native language ability, although what has been "learned" is not the cognitive processes that accompany language use so much as the new linguistic and cultural "code" of the idiom.

Implications for the Classroom

Several immediate implications can be drawn from the insights provided by the focus on cognitive development. First, for the second language to follow the pattern of development of the native language, similar conditions should be present insofar as it is possible to provide them. It is unrealistic to presume that the actual environmental conditions of infancy and childhood can be duplicated in the classroom, since there is no comparison between the total "exposure time" to the language. The child learning the native language is totally immersed in the medium, beginning at birth, and is in the presence of a language community that is well aware (albeit intuitively) of the stages of communicative ability through which the young learner will pass. The child's interlocutor has a tolerance for the "baby talk" and metalanguage that the child uses and does not reject the novice speaker's efforts to communicate. The young learner can ask for help or explanation any time an unfamiliar linguistic situation is encountered. And above all else, these novice learners generally are not placed in a psychologically threatening situation where they are expected to use language beyond their ability to do so.

Once formal instruction begins in the native language, greater emphasis is placed upon accuracy, variety of structure, increased vocabulary, style, and so on. This is recognized, however, as study *of* the language rather than as the essence of the language itself. As the learners mature, efforts are made to help them develop an appreciation for literature and an ability to express themselves personally and creatively. The ability to use the native language—and the improvement of that ability—is perceived generally as a life-long learning experience and is frequently a critical factor both in personal and professional growth.

In the second-language classroom, then, the teacher should attempt to make maximum use of the short time available. Students need to have as much exposure as possible to the target language, without being expected to begin to produce the language prematurely. The teacher should always be an interested and sympathetic interlocutor, willing to give the learner credit for the effort made to communicate. Students should not be placed in situations that are so far beyond their abilities to perform that they are threatened psychologically.

In the native language, one can focus on formal study of the language in the classroom and consider communicative practice to be an out-of-class activity. Not so in the foreign language classroom. Here, time for both instruction and practice must be scheduled and provided on a regular basis. Teachers must consciously recognize the need for periods of communicative practice where the exchange of real and interesting information among the students is the primary objective, and for periods of formalized, teacher-centered instruction where emphasis is placed upon accuracy of form, content, and the like. Hence, developing functional proficiency implies placing importance upon both the message and the form, and structuring the classroom to strike the appropriate balance.

In conclusion, the level of language use of which a person is capable is dependent upon two major variables: 1) the stage of cognitive development the user has attained, and 2) the extent to which the user has mastered the linguistic and cultural code of the language itself. Language is a manifestation of thought, and thought cannot exist without language. It is the responsibility of the teacher to establish goals and objectives that recognize this interrelationship and then to develop instructional strategies that are sensitive to the cognitive, the affective, and the linguistic needs and desires of the learner. In this way, an environment is established within which functional proficiency in the second language may begin to emerge.

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